UK

Richard Burbidge Fusion™ stair balustrading comprises a patented system of round newel posts and handrails connected together using a series of metal brackets. Balusters fix into place using patented brackets designed to adjust to suit staircase pitches between 38° & 45°.

Note – When installing Richard Burbidge Fusion™, remember at all times that when you are assembling a pre-finished product extra care should be taken to avoid damaging the finish. All finishes are carefully checked prior to leaving the factory and are designed to withstand most types of normal use, however it is possible to damage these with sharp tools.

Please check all components carefully PRIOR to installation for any damage to the surface. Please note Richard Burbidge cannot be held responsible for any damage once installation has commenced.

Fusion™ carries design registration and has patent pending. Genuine Richard Burbidge Fusion™ components carry the Richard Burbidge dovetail logo. Only genuine components have been independently tested to guarantee conformity to UK building regulations.

Fusion™ is designed for use in domestic situations and will fit staircases with pitches between 38° - 45° and handrail heights of 900mm stairs and 1000mm landings. Fusion™ is tested to UK strength requirements of 0.36kNm.

Tools required: Fusion™ Tool Kit (3mm diameter drill bit, crosshead No. 2 screwdriver, 19mm bosksocket spanner 180mm long, 13mm spade bit, 20mm spade bit, 25mm spade bit, 5mm allen key, drill depth gauge), electric or battery drill, spirit levels, tape measure, a good handsaw, adjustable bevel, 45mm. No. 8 crosshead countersunk screws for fixing the baserail to landing.

Fusion™ is manufactured to exacting tolerances, however as timber is a natural material some expansion and or shrinkage of the timber components can occur. If the newels and rails are slightly too big for the connectors, gently sandshave the components to allow for a tight fit, being careful to only rework the area of the timber component that will be concealed by the metal connector. Alternatively if the timber component is loose in the connector, a rigid fix can be achieved using a proprietary gap filling adhesive.

Assembling Staircase Balustrading

Fusion™ will fit most staircase configurations. For further details please refer to the staircase configuration drawings in the brochure/below.

Fusion™ can be fitted to either existing or new newel bases. To use existing newel bases, these must be fixed central to the riser and inside the nosing to the side of the stairs (Fig. 1).

Before removing existing newel bases, check that they are non-supporting or do not form a structural part of the staircase design.

When using Fusion™ your existing newel bases must be a minimum of 82mm x 82mm. If less, face/build up existing bases using suitable facing material.

These instructions are for a cut-string straight flight staircase of 12/13 treads with a return length of landing.

Existing Bases

Fusion™ stairparts use pre-cut balusters, and all cut-off points are referenced from the top of the baserail upwards. The system is designed to automatically compensate for any slight inaccuracies in cutting off the existing newel post. To establish the height of the newel bases place the baserail onto the nosings and to the side face of the bases. Mark the top edge of the baserail to the face of the newel base (Fig. 2).

Bottom Newel Base

From the line representing the top edge of the baserail mark a line upwards through the center point of the newel base and where the two lines intersect measure up 175mm (Fig. 3).

Top Newel Base

The top newel base should be marked out in the same way as the bottom, but the height should be set at 125mm (Fig. 3).

It is important that existing newel bases are cut off squarely so that the newel posts are perfectly vertical.

Mid Newel Base

For strength purposes a mid newel is required for straight runs over 1800mm.

There are two options for fixing a mid newel on your staircase based on the number of treads. For staircases with an even number of treads the mid newel should be fixed traditionally, central to the riser (Fig. 4).

For stairs with an odd number of treads the newel base must be fixed on top of the tread and 70mm from the nosing using the Richard Burbidge mid newel tread connector (Fig. 5).

How you fix the tread connector will depend on your staircase construction.

For traditionally constructed timber stairs use 2 x 50mm and 2 x 25mm crosshead No. 8's (Fig. 6). For concrete stairs use 4 x 50mm crosshead No. 8's and appropriate anchor fixing/plug. Insert and fix the threaded bar and slide the mid newel base over the bar and onto the tread connector. The mid newel should be set exactly as the bottom newel, at 175mm (Fig. 3). Trim any excess off the bottom of the newel base.

Suspended Baserail

You are now ready to measure and fit the baserail. Position the baserail to the bottom newel base as illustrated (Fig. 7) and where it intersects the next newel base, mark the bottom edge. From this mark, measure back 78mm, mark and cut to length.

Fix the two-part baserail connector assembly together (MMBSCSQ) and then fix to the baserail using the screws supplied. Place between newel bases with the bottom edge of the baserail resting on the staircase nosings and mark the position of the baserail connectors to the face of the newel bases using a pencil. Disassemble the two-piece baserail connector and fit the flat plate part of the connector to the newel bases using the screws supplied. Finally, with the baserail in position, reconnect the two-part connector.

Newel Base Connectors

Newel base connectors (MMNCSQ) can now be fixed to the newel bases using the stud and barrel nut supplied. From the top of the newel base on the centre line previously marked, measure down 125mm. Using a 20mm spade bit, drill a hole to a depth of 30mm beyond the centre point of the newel base (Fig. 8). On the top of the newel base find the centre by drawing two diagonal lines from corner to corner. Using a 13mm spade bit drill to a depth of 125mm. Note all drill operations should be straight and accurate. Assemble the newel base connector (MMNCSQ) to newel base (Fig. 9) by locating the barrel nut and fully inserting the fixing stud. Place the newel base connector over the fixing stud and tighten nuts using 19mm socket/box spanner making sure that the connectors are positioned as illustrated (Fig. 10).

Note – in most cases when tightening the base connector to the existing bases, the retaining ring on the underside of the connector should pull into the newel base. However depending on the timber type it maybe necessary to disassemble the connector and chisel a clearance ring of approximately 3mm wide by ¼" deep allowing the newel base connector to sit flush.

Cut the bottom and mid newel posts to a length of 20 ½", and drill a 1" diameter clearance hole at a depth of 1" to the underside of the post to allow it to fit over the stud assembly. Fix post to the connector using screws provided making sure the post is fully inserted. Fix the top post in the same manner but do not cut the post to length at this stage.

Note – to mark the position of the clearance hole in the newel post, place newel into base connector, knock gently and then remove post.

New Newel Bases

Fit new newel bases central to the front faces of the staircase risers checking that they are vertical and at the correct height (Fig. 1).

Note - remember to add the thickness of the baserail when marking the intersection points as illustrated in (Fig. 2).

Fixing Connectors & Handrails

Fixing the handrails and connectors is best done by two people. To establish the correct angles of connectors and lengths of handrail, you will need to assemble two balusters. Fit the baluster brackets to the ends of the staircase balusters by inserting the screws supplied for a right fit (Fig. 11). Note – ensure the baluster brackets are in line with each other by tightening the screws with the baluster held on two blocks of timber (Fig. 12). The balusters are precut to length and should not require any modifications.

The bottom connector (MMBSCSQ), mid newel connector (MMNCSQ) and top connector (MMTCSQ) are a two-part assembly. Attach the newel post part of the connectors to the newel posts. Note – the top newel post connector slides over the top newel post and should not be permanently fixed at this stage. The bottom and mid newel post connectors should now be attached to the overlong handrail, being careful to slide the mid newel handrail connector gently along the handrail to avoid damage. Offer the handrail assembly to the newel post connectors and to check that the handrail is parallel to the baserail and at the correct height, position assembled stair balusters to the underside of the handrail next to the bottom and mid-newel (Fig. 13).

Adjust the height of the top connector by sliding up and down the top post and check the balusters are vertical using a spirit level. Mark the position of the top connector to the newel post using a pencil and the handrail to establish the length of the handrail required. Cut the handrail to the required length. Fit the top newel post connector and to check that the handrail is parallel to the baserail and at the correct height, position the newel post part of the connector using the screws supplied. It is important that this connector is fixed so that it is in line with the bottom and mid newel. Fix the top handrail connector to the end of the handrail and then fix the handrail to all newel post connectors checking that everything is vertical and parallel before securing all connector bolts, nuts and screws (Fig. 14).

The first and last balusters between newel posts can now be fixed. To conform to building regulations regarding spacing the last baluster must be fixed so that it is tight against the handrail connector. Fix the baluster between the handrail and baserail using the screws supplied, checking that it is vertical with a spirit level. Fix the bottom baluster and space so that the gap between the bottom newel and baluster is no greater than 99mm.

To space the remaining balusters evenly up the stairs measure the distance between the spacing marks (notches on the side of the brackets) of the bottom and top balusters already installed (Fig. 15) and divide by 148.5mm. Round the answer up to the next whole number and divide this whole number back into your original measurement to give an exact spacing.

Example - **2159mm** between bottom and top spacing marks divided by **148.5mm = 14.45**, rounded up to **15**.

2159mm ÷ 15 = 143.9mm spacing measurement.

Fix all remaining baluster brackets to balusters using the screws supplied (Fig. 11) ensuring the brackets are in line using the blocks of wood described previously (Fig. 12). Mark the spacing between balusters to the baserail either using a pencil and tape measure or by marking and cutting a piece of timber to the required length. Fix the assembled brackets and balusters to the baserail first and then using a spirit level to the underside of the handrail.

Note – if you have a particularly short flight of stairs you may need to re-space the balusters to provide a more pleasing effect, remembering at all times to space them no more than 99mm apart.

Assembling Horizontal/Landing Balustrades

Using standard Fusion™ components you will require a minimum 120mm measured from the centre of the staircase baserail to the centre of the landing baserail for stairs with landings at 180° to the stairs.

Cut and mitre the landing baserail to size and place into position on the landing. Do not fix to the landing floor at this stage (Fig. 16). Fix the landing baluster brackets to the landing balusters.

Place an off-cut of handrail loosely into the landing connector (MMLCSQ). Position one assembled landing baluster onto the baserail and place the handrail and connector on top of this baluster and to the side of the top newel to establish the required height of the post. Mark and cut to suit (Fig. 17).

Where the landing balustrade ends against the wall, mark the position of the wall connector (MMWCSQ) on the wall by placing an assembled landing baluster and baluster connectors to off-cuts of baserail and handrail. Mark the position of the wall connector (MMWCSQ) to the wall and drill and plug to suit (Fig. 17).

Note – before drilling and plugging this fixed point check that the landing handrail will be parallel using a spirit level, if the landing floor is slightly out, reposition the wall connector (MMWCSQ) and pack the underside of the landing baserail accordingly.

Place an off-cut of handrail to the landing connector (MMLCSQ) and position on the top newel. Push the landing handrail into the wall connector (MMWCSQ) and offer the horizontal turn (MMHTRSG or MMHTLSG) to where the two handrails meet to establish lengths of cut. Mark and cut the handrails to the required length. Reposition the landing handrail to the wall connector (MMWCSQ) and fix horizontal turn (MMHTRSG or MMHTLSG) to the other end of this rail.

Fix the short return length of handrail onto the other leg of the horizontal turn (MMHTRSG or MMHTLSG) and the landing connector (MMLCSQ) to the other end of this short return length of handrail and position over the top newel post (Fig. 17).

Note – before screwing all connectors to rails and top post, we recommend a final check for parallel. Use a spirit level for the handrail and an assembled balusterbalusterbalusters between the rails.

To calculate the exact number of landing balusters either divide the total landing length by 117mm, which will give a gap of approximately 98mm, or alternatively you may find it aesthetically more pleasing to space the landing balusters so that they are in line with the staircase balusters. Mark the position of the baluster brackets to the baserail and secret fix the baserail to the landing floorboards using 2" No. 8 countersink screws every 4th baluster.

Assemble all baluster brackets to the end of the landing balusters by inserting the relevant fixing screw 63mm No. 8 into the underside of the brackets and tighten (Fig. 11). Ensure that the brackets are in line with each other as previously described for staircase balusters using two square blocks of timber (Fig. 12).

Fix all bottom baluster brackets to the baserail using 30mm No. 6 screws and finally secure the top baluster brackets to the underside of the landing handrail using 30mm No. 6 screws checking for vertical with a spirit level.

Note - in most cases when tightening the base connector to the existing bases, the retaining ring on the underside of the connector should pull into the newel base. However depending on the timber type it maybe necessary to disassemble the connector and chisel a clearance ring of approximately ¼" wide by ¼" deep allowing the newel base connector to sit flush.

Cut the bottom and mid newel posts to a length of 20 ½", and drill a 1" diameter clearance hole at a depth of 1" to the underside of the post to allow it to fit over the stud assembly. Fix post to the connector using screws provided making sure the post is fully inserted. Fix the top post in the same manner but do not cut the post to length at this stage.

Note – to mark the position of the clearance hole in the newel post, place newel into base connector, knock gently and then remove post.

New Newel Bases

Fit new newel bases central to the front faces of the staircase risers checking that they are vertical and at the correct height (Fig. 1).

Note - remember to add the thickness of the baserail when marking the intersection points as illustrated in (Fig. 2).

Fixing Connectors & Handrails

Fixing the handrails and connectors is best done by two people. To establish the correct angles of connectors and lengths of handrail, you will need to assemble two balusters. Fit the baluster brackets to the ends of the staircase balusters by inserting the screws supplied for a right fit (Fig. 11). Note – ensure the baluster brackets are in line with each other by tightening the screws with the baluster held on two blocks of timber (Fig. 12). The balusters are pre-cut to length and should not require any modifications.

The bottom connector (MMBCSQ), mid newel connector (MMNCSQ) and top connector (MMTCSQ) are a two-part assembly. Attach the newel post part of the connectors to the newel posts. Note – the top newel post connector slides over the top newel post and should not be permanently fixed at this stage. The bottom and mid newel post connectors should now be attached to the overlong handrail, being careful to slide the mid newel handrail connector gently along the handrail to avoid damage. Offer the handrail assembly to the newel post connectors and to check that the handrail is parallel to the baserail and at the correct height, position assembled stair balusters to the underside of the handrail next to the bottom and mid-newel (Fig. 13).

Adjust the height of the top connector by sliding up and down the top post and check the balusters are vertical using a spirit level. Mark the position of the top connector to the newel post using a pencil and the handrail to establish the length of the handrail required. Cut the handrail to the required length. Fit the top newel post connector and to check that the handrail is parallel to the baserail and at the correct height, position the newel post part of the connector using the screws supplied. It is important that this connector is fixed so that it is in line with the bottom and mid newel. Fix the top handrail connector to the end of the handrail and then fix the handrail to all newel post connectors checking that everything is vertical and parallel before securing all connector bolts, nuts and screws (Fig. 14).

The first and last balusters between newel posts can now be fixed. To conform to building regulations regarding spacing the last baluster must be fixed so that it is tight against the handrail connector. Fix the baluster between the handrail and baserail using the screws supplied, checking that it is vertical with a spirit level. Fix the bottom baluster and space so that the gap between the bottom newel and baluster is no greater than 3 ½".

To space the remaining balusters evenly up the stairs measure the distance between the spacing marks (notches on the side of the brackets) of the bottom and top balusters already installed (Fig. 15) and divide by 5 ½". Round the answer up to the next whole number and divide this whole number back into your original measurement to give an exact spacing.

Example - **85"** between bottom and top spacing marks divided by **5 ½" = 14.45**, rounded up to **15**.

85" ÷ 15 = 5 ¾" spacing measurement.

Fix all remaining baluster brackets to balusters using the screws supplied (Fig. 11) ensuring the brackets are in line using the blocks of wood described previously (Fig. 12). Mark the spacing between balusters to the baserail either using a pencil and tape measure or by marking and cutting a piece of timber to the required length. Fix the assembled brackets and balusters to the baserail first and then using a spirit level to the underside of the handrail.

Note – if you have a particularly short flight of stairs you may need to re-space the balusters to provide a more pleasing effect, remembering at all times to space them no more than 3 ½" apart.

Assembling Horizontal/Landing Balustrades

Using standard Fusion™ components you will require a minimum 4 ¾" measured from the centre of the staircase baserail to the centre of the landing baserail for stairs with landings at 180° to the stairs.

Cut and mitre the landing baserail to size and place into position on the landing. Do not fix to the landing floor at this stage (Fig. 16). Fix the landing baluster brackets to the landing balusters.

Place an off-cut of handrail loosely into the landing connector (MMLCSQ). Position one assembled landing baluster onto the baserail and place the handrail and connector on top of this baluster and to the side of the top newel to establish the required height of the post. Mark and cut to suit (Fig. 17).

Where the landing balustrade ends against the wall, mark the position of the wall connector (MMWCSQ) on the wall by placing an assembled landing baluster and baluster connectors to off-cuts of baserail and handrail. Mark the position of the wall connector (MMWCSQ) to the wall and drill and plug to suit (Fig. 17).

Note – before drilling and plugging this fixed point check that the landing handrail will be parallel using a spirit level, if the landing floor is slightly out, reposition the wall connector (MMWCSQ) and pack the underside of the landing baserail accordingly.

Place an off-cut of handrail to the landing connector (MMLCSQ) and position on the top newel. Push the landing handrail into the wall connector (MMWCSQ) and offer the horizontal turn (MMHTRSG or MMHTLSG) to where the two handrails meet to establish lengths of cut. Mark and cut the handrails to the required length. Reposition the landing handrail to the wall connector (MMWCSQ) and fix horizontal turn (MMHTRSG or MMHTLSG) to the other end of this rail.

Fix the short return length of handrail onto the other leg of the horizontal turn (MMHTRSG or MMHTLSG) and the landing connector (MMLCSQ) to the other end of this short return length of handrail and position over the top newel post (Fig. 17).

Note – before screwing all connectors to rails and top post, we recommend a final check for parallel. Use a spirit level for the handrail and an assembled balusterbalusterbalusters between the rails.

To calculate the exact number of landing balusters either divide the total landing length by 117mm, which will give a gap of approximately 98mm, or alternatively you may find it aesthetically more pleasing to space the landing balusters so that they are in line with the staircase balusters. Mark the position of the baluster brackets to the baserail and secret fix the baserail to the landing floorboards using 2" No. 8 countersink screws every 4th baluster.

Assemble all baluster brackets to the end of the landing balusters by inserting the relevant fixing screw 63mm No. 8 into the underside of the brackets and tighten (Fig. 11). Ensure that the brackets are in line with each other as previously described for staircase balusters using two square blocks of timber (Fig. 12).

Fix all bottom baluster brackets to the baserail using 30mm No. 6 screws and finally secure the top baluster brackets to the underside of the landing handrail using 30mm No. 6 screws checking for vertical with a spirit level.

US

Richard Burbidge Fusion™ stair balustrading comprises a patented system of round newel posts and handrails connected together using a series of metal brackets. Balusters fix into place using patented brackets designed to adjust to suit staircase pitches between 38° & 45°.

Note – When installing Richard Burbidge Fusion™, remember at all times that when you are assembling a pre-finished product extra care should be taken to avoid damaging the finish. All finishes are carefully checked prior to leaving the factory and are designed to withstand most types of normal use, however it is possible to damage these with sharp tools.

Please check all components carefully PRIOR to installation for any damage to the surface. Please note Richard Burbidge cannot be held responsible for any damage once installation has commenced.

Fusion™ carries design registration and has patent pending. Genuine Richard Burbidge Fusion™ components carry the Richard Burbidge dovetail logo. Only genuine components have been independently tested to guarantee conformity to UK building regulations.

Fusion™ is designed for use in domestic situations and will fit staircases with pitches between 38° - 45° and handrail heights of 35 ¼" stairs and 39 ¼" landings. Fusion™ is tested to UK strength requirements of 0.36kNm.

Tools required: Fusion™ Tool Kit (1/8" diameter drill bit, crosshead No. 2 screwdriver, ½" bosksocket spanner 4" long, ¼" spade bit, ⅜" spade bit, ½" allen key, drill depth gauge), electric or battery drill, spirit levels, tape measure, a good handsaw, adjustable bevel, 2" No. 8 crosshead countersunk screws for fixing the baserail to landing.

Fusion™ is manufactured to exacting tolerances, however as timber is a natural material some expansion and or shrinkage of the timber components can occur. If the newels and rails are slightly too big for the connectors, gently sandshave the components to allow for a tight fit, being careful to only rework the area of the timber component that will be concealed by the metal connector. Alternatively if the timber component is loose in the connector, a rigid fix can be achieved using a proprietary gap filling adhesive.

Assembling Staircase Balustrading

Fusion™ will fit most staircase configurations. For further details please refer to the staircase configuration drawings in the brochure/below.

Fusion™ can be fitted to either existing or new newel bases. To use existing newel bases, these must be fixed central to the riser and inside the nosing to the side of the stairs (Fig. 1).

Before removing existing newel bases, check that they are non-supporting or do not form a structural part of the staircase design.

When using Fusion™ your existing newel bases must be a minimum of 3 ¼" x 3 ¼". If less, face/build up existing bases using suitable facing material.

These instructions are for a cut-string straight flight staircase of 12/13 treads with a return length of landing.

Existing Bases

Fusion™ stairparts use pre-cut balusters, and all cut-off points are referenced from the top of the baserail upwards. The system is designed to automatically compensate for any slight inaccuracies in cutting off the existing newel post. To establish the height of the newel bases place the baserail onto the nosings and to the side face of the bases. Mark the top edge of the baserail to the face of the newel base (Fig. 2).

Bottom Newel Base

From the line representing the top edge of the baserail mark a line upwards through the center point of the newel base and where the two lines intersect measure up 6 ⅞" (Fig. 3).

Top Newel Base

The top newel base should be marked out in the same way as the bottom, but the height should be set at 4 ½" (Fig. 3).

It is important that existing newel bases are cut off squarely so that the newel posts are perfectly vertical.

Mid Newel Base

For strength purposes a mid newel is required for straight runs over 6'.

There are two options for fixing a mid newel on your staircase based on the number of treads. For staircases with an even number of treads the mid newel should be fixed traditionally, central to the riser (Fig. 4).

For stairs with an odd number of treads the newel base must be fixed on top of the tread and 3 ¼" from the nosing using the Richard Burbidge mid newel tread connector (Fig. 5).

How you fix the tread connector will depend on your staircase construction.

For traditionally constructed timber stairs use 2 x 50mm and 2 x 25mm crosshead No. 8's (Fig. 6). For concrete stairs use 4 x 2" crosshead No. 8's and appropriate anchor fixing/plug. Insert and fix the threaded bar and slide the mid newel base over the bar and onto the tread connector. The mid newel should be set exactly as the bottom newel, at 4 ½" (Fig. 3). Trim any excess off the bottom of the newel base.

Suspended Baserail

You are now ready to measure and fit the baserail. Position the baserail to the bottom newel base as illustrated (Fig. 7) and where it intersects the next newel base, mark the bottom edge. From this mark, measure back 3", mark and cut to length.

Fix the two-part baserail connector assembly together (MMBSCSQ) and then fix to the baserail using the screws supplied. Place between newel bases with the bottom edge of the baserail resting on the staircase nosings and mark the position of the baserail connectors to the face of the newel bases using a pencil. Disassemble the two-piece baserail connector and fit the flat plate part of the connector to the newel bases using the screws supplied. Finally, with the baserail in position, reconnect the two-part connector.

Newel Base Connectors

Newel base connectors (MMNCSQ) can now be fixed to the newel bases using the stud and barrel nut supplied. From the top of the newel base on the centre line previously marked, measure down 5". Using a ¾" spade bit, drill a hole ½" beyond the centre point of the newel base (Fig. 8). On the top of the newel base find the centre by drawing two diagonal lines from corner to corner. Using a ½" spade bit drill to a depth of 5". Note all drill operations should be straight and accurate. Assemble the newel base connector (MMNCSQ) to newel base (Fig. 9) by locating the barrel nut and fully inserting the fixing stud. Place the newel base connector over the fixing stud and tighten nuts using ½" socket/box spanner making sure that the connectors are positioned as illustrated (Fig. 10).

Note – in most cases when tightening the base connector to the existing bases, the retaining ring on the underside of the connector should pull into the newel base. However depending on the timber type it maybe necessary to disassemble the connector and chisel a clearance ring of approximately ¼" wide by ½" deep allowing the newel base connector to sit flush.

Cut the bottom and mid newel posts to a length of 20 ½", and drill a 1" diameter clearance hole at a depth of 1" to the underside of the post to allow it to fit over the stud assembly. Fix post to the connector using screws provided making sure the post is fully inserted. Fix the top post in the same manner but do not cut the post to length at this stage.

Note – to mark the position of the clearance hole in the newel post, place newel into base connector, knock gently and then remove post.

New Newel Bases

Fit new newel bases central to the front faces of the staircase risers checking that they are vertical and at the correct height (Fig. 1).

Note - remember to add the thickness of the baserail when marking the intersection points as illustrated in (Fig. 2).

Fixing Connectors & Handrails

Fixing the handrails and connectors is best done by two people. To establish the correct angles of connectors and lengths of handrail, you will need to assemble two balusters. Fit the baluster brackets to the ends of the staircase balusters by inserting the screws supplied for a right fit (Fig. 11). Note – ensure the baluster brackets are in line with each other by tightening the screws with the baluster held on two blocks of timber (Fig. 12). The balusters are pre-cut to length and should not require any modifications.

The bottom connector (MMBCSQ), mid newel connector (MMNCSQ) and top connector (MMTCSQ) are a two-part assembly. Attach the newel post part of the connectors to the newel posts. Note – the top newel post connector slides over the top newel post and should not be permanently fixed at this stage. The bottom and mid newel post connectors should now be attached to the overlong handrail, being careful to slide the mid newel handrail connector gently along the handrail to avoid damage. Offer the handrail assembly to the newel post connectors and to check that the handrail is parallel to the baserail and at the correct height, position assembled stair balusters to the underside of the handrail next to the bottom and mid-newel (Fig. 13).

Adjust the height of the top connector by sliding up and down the top post and check the balusters are vertical using a spirit level. Mark the position of the top connector to the newel post using a pencil and the handrail to establish the length of the handrail required. Cut the handrail to the required length. Fit the top newel post connector and to check that the handrail is parallel to the baserail and at the correct height, position the newel post part of the connector using the screws supplied. It is important that this connector is fixed so that it is in line with the bottom and mid newel. Fix the top handrail connector to the end of the handrail and then fix the handrail to all newel post connectors checking that everything is vertical and parallel before securing all connector bolts, nuts and screws (Fig. 14).

The first and last balusters between newel posts can now be fixed. To conform to building regulations regarding spacing the last baluster must be fixed so that it is tight against the handrail connector. Fix the baluster between the handrail and baserail using the screws supplied, checking that it is vertical with a spirit level. Fix the bottom baluster and space so that the gap between the bottom newel and baluster is no greater than 3 ½".

To space the remaining balusters evenly up the stairs measure the distance between the spacing marks (notches on the side of the brackets) of the bottom and top balusters already installed (Fig. 15) and divide by 5 ½". Round the answer up to the next whole number and divide this whole number back into your original measurement to give an exact spacing.

Example - **85"** between bottom and top spacing marks divided by **5 ½" = 14.45**, rounded up to **15**.

85" ÷ 15 = 5 ¾" spacing measurement.

Fix all remaining baluster brackets to balusters using the screws supplied (Fig. 11) ensuring the brackets are in line using the blocks of wood described previously (Fig. 12). Mark the spacing between balusters to the baserail either using a pencil and tape measure or by marking and cutting a piece of timber to the required length. Fix the assembled brackets and balusters to the baserail first and then using a spirit level to the underside of the handrail.

Note – if you have a particularly short flight of stairs you may need to re-space the balusters to provide a more pleasing effect, remembering at all times to space them no more than 3 ½" apart.

Assembling Horizontal/Landing Balustrades

Using standard Fusion™ components you will require a minimum 4 ¾" measured from the centre of the staircase baserail to the centre of the landing baserail for stairs with landings at 180° to the stairs.

Cut and mitre the landing baserail to size and place into position on the landing. Do not fix to the landing floor at this stage (Fig. 16). Fix the landing baluster brackets to the landing balusters.

Place an off-cut of handrail loosely into the landing connector (MMLCSQ). Position one assembled landing baluster onto the baserail and place the handrail and connector on top of this baluster and to the side of the top newel to establish the required height of the post. Mark and cut to suit (Fig. 17).

Where the landing balustrade ends against the wall, mark the position of the wall connector (MMWCSQ) on the wall by placing an assembled landing baluster and baluster connectors to off-cuts of baserail and handrail. Mark the position of the wall connector (MMWCSQ) to the wall and drill and plug to suit (Fig. 17).

Note – before drilling and plugging this fixed point check that the landing handrail will be parallel using a spirit level, if the landing floor is slightly out, reposition the wall connector (MMWCSQ) and pack the underside of the landing baserail accordingly.

Place an off-cut of handrail to the landing connector (MMLCSQ) and position on the top newel. Push the landing handrail into the wall connector (MMWCSQ) and offer the horizontal turn (MMHTRSG or MMHTLSG) to where the two handrails meet to establish lengths of cut. Mark and cut the handrails to the required length. Reposition the landing handrail to the wall connector (MMWCSQ) and fix horizontal turn (MMHTRSG or MMHTLSG) to the other end of this rail.

Fix the short return length of handrail onto the other leg of the horizontal turn (MMHTRSG or MMHTLSG) and the landing connector (MMLCSQ) to the other end of this short return length of handrail and position over the top newel post (Fig. 17).

Note – before screwing all connectors to rails and top post, we recommend a final check for parallel. Use a spirit level for the handrail and an assembled balusterbalusterbalusters between the rails.

To calculate the exact number of landing balusters either divide the total landing length by 4 ⅝", which will give a gap of approximately 3 ¾", or alternatively you may find it aesthetically more pleasing to space the landing balusters so that they are in line with the staircase balusters. Mark the position of the baluster brackets to the baserail and secret fix the baserail to the landing floorboards using 2" No. 8 countersink screws every 4th baluster.

Assemble all baluster brackets to the end of the landing balusters by inserting the relevant fixing screw (2 ½") into the underside of the brackets and tighten (Fig. 11). Ensure that the brackets are in line with each other as previously described for staircase balusters using two square blocks of timber (Fig. 12).

Fix all bottom baluster brackets to the baserail using 1 ¼" No. 6 screws and finally secure the top baluster brackets to the underside of the landing handrail using 1 ¼" No. 6 screws checking for vertical with a spirit level.

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La balustrade Richard Burbidge est un système breveté. Elle permet de réaliser des rampants d'escaliers ou de balustrade horizontale. Elle se compose de poteaux et mains-courantes ronds qui s'assemblent les uns aux autres à l'aide d'une gamme complète de connecteurs métalliques. Les balustres se fixent avec des connecteurs brevetés qui sont conçus pour s'ajuster en fonction de la pente d'escalier. Cette dernière devant être comprise entre 38° et 45°.

Remarque – Pour installer le système Fusion™ de Richard Burbidge, souvenez-vous à chaque instant que, lorsque vous assemblez un produit pré vernis, des précautions supplémentaires sont à prendre pour éviter d'endommager la finition. Toutes les finitions sont soigneusement contrôlées avant l'expédition des pièces et sont conçues pour supporter la plupart des types d'utilisation normale ; cependant, elles pourraient être endommagées par des outils tranchants.

Veuillez contrôler attentivement tous les composants AVANT la pose afin de vérifier qu'aucun élément n'est endommagé. Notez que Richard Burbidge ne pourra en aucun cas être tenu responsable des dommages causés lors de la pose.

La conception de Fusion™ est déposée et brevetée. Seuls les composants Fusion™ d'origine fabriqués par Richard Burbidge sont frappés du logo Richard Burbidge représentant un assemblage par queue d'aronde. Seuls ces composants d'origine ont été testés de manière indépendante pour garantir leur conformité à la réglementation britannique de la construction.

Fusion™ est conçu pour être utilisé dans des habitations privées et s'adapte aux escaliers ayant une pente comprise entre 38° et 45°. La hauteur de la main-courante est de 900 mm pour les rampants d'escalier et de 1000 mm pour les balustrades horizontales. Fusion™ est testé selon les prescriptions britanniques de résistance à 0,36kNm.

Outillage nécessaire: Trousse à outils Fusion™ (foret de diamètre 3mm, tournevis cruciforme No. 2, clé polypansbloc de 19mm - longueur 180mm, foret à trois pointes de 13mm, foret à trois pointes de 20mm, foret à trois pointes de 25mm, de Allen de 5mm, jauge de profondeur de perçage), perceuse électrique, niveau à bulle, mètre ruban, une bonne scie, fausse équerre, vis à tête fraisée de 45mm à empreinte cruciforme No. 8 pour la fixation de la lisse base.

Fusion™ est fabriqué dans le respect absolu des écarts tolérés, mais comme le bois est une matière naturelle, les éléments en bois peuvent se dilater ou se rétracter. Si les poteaux et les rampes sont légèrement trop gros pour les joints, étasbrez et ponsez doucement ces éléments pour qu'ils s'encastrent parfaitement, en faisant attention à ne retravailler que la partie de l'élément en bois qui sera cachée par le joint en métal. Si au contraire, l'élément en bois n'est pas assez serré dans le joint, vous obtiendrez une fixation solide en mettant de la pâte à joint adhésive spécialement destinée à cet effet.

Montage de la balustrade pour un rampant d'escalier

Fusion™ s'adapte à la plupart des configurations de cage d'escalier. Pour de plus amples détails, veuillez consulter les plans de configuration d'escaliers dans la brochure.

Fusion™ peut être assemblé avec les embases de poteau Fusion™ ou en réutilisant les embases de poteau existantes. Dans ce dernier cas, celles-ci doivent impérativement être centrée sur le limon et la face avant de la contremarche ou le nez de marche à l'installer ne possède pas de contremarche (Fig. 1).

Avant de démonter les poteaux existants, contrôlez qu'ils ne sont pas porteurs ou qu'ils ne contribuent pas à la bonne tenue de la cage d'escalier.

Lorsque vous garderez et réutiliserez des embases de poteau existantes, elles doivent mesurer au minimum 82mm x 82mm. Si elles mesurent moins, garnissez-les à l'aide d'un matériau d'apport adapté.

Ces instructions s'appliquent à l'escalier à un d'un escalier à crémaillère comportant une volée droite de 12/13 marches avec un retour de palier.

Embases de poteau existantes

Si vous utilisez de nouvelles embases de poteau Fusion™, passez directement à la rubrique intitulée "Nouvelles embases de poteau" puis référez-vous au paragraphe intitulé "Base base suspendue". Les balustres Fusion™ sont déjà mis à longueur. Les balustres Fusion™ sont déjà mis à longueur. Les dimensions permettant de localiser les coupes sont prises à partir du dessus de la lisse base. Le système est conçu pour compenser automatiquement les légères imprécisions de découpe du poteau existant. Pour déterminer la hauteur des embases de poteau, posez la lisse base sur les nez de marche de l'escalier et appuyez-la contre la face latérale de l'escalier des embases de poteau. Tracez le dessus de la lisse base sur chaque embase (Fig. 2).

Embase de poteau base

Sur la face de l'embase (située à l'intérieur de l'escalier), tracer la verticale passant par l'axe de l'embase. Elle coupe le trait correspondant à la face supérieure de la lisse base. Sur la partie de ce point d'intersection, remontez de 125mm, tracer la perpendiculaire à l'axe sur le pourtour de l'embase et scier la (Fig. 3). Il est impératif que la coupe soit d'équerre afin que le dessus de la lisse base soit parfaitement horizontal. Ainsi le poteau sera parfaitement vertical. Une fois l'embase sciée, faites un montage à blanc du poteau et vérifiez la verticalité de ce dernier avec un niveau à bulle. Au besoin, ponsez le dessus de l'embase. La hauteur sera alors légèrement diminuée mais le connecteur pour poteau (fixation du poteau sur son embase) vous permettra de compenser cette différence.

Une fois le poteau assemblé, vous pouvez chanfreiner les arêtes de l'embase pour des raisons esthétiques.

Embase de poteau haut

Procéder de la même manière que pour le poteau bas en ramenant les 175mm à 125mm (Fig. 3).

Embase de poteau intermédiaire

Pour des besoins de résistance, un poteau intermédiaire est nécessaire pour les volées droites de plus de 1800mm.

Deux options sont possibles pour fixer sur un poteau intermédiaire sur votre escalier, selon le nombre de marches. Pour les escaliers comportant un nombre pair de marches, le poteau intermédiaire devra être fixé de façon traditionnelle, centré par rapport à l'axe de la contremarche ou au nez de marche à l'exulier de possède pas de contremarche (Fig. 4).

Pour les escaliers ayant un nombre impair de marches, l'embase de poteau doit être fixée sur le dessus de la marche et 79mm du nez de la marche suivante (Fig. 5). À l'aide du connecteur pour poteau intermédiaire de Richard Burbidge.

La façon dont vous fixerez le connecteur de poteau dépendra du matériau constituant votre escalier.

Pour les escaliers en bois de construction traditionnelle, utilisez 2 vis de 50mm et 2 vis de 19mm à empreinte cruciforme No. 8 (Fig. 6). Pour les escaliers en béton, utilisez 4 vis de 50mm à empreinte cruciforme No. 8 et les chevilles d'ancrage appropriées. Insérez et fixez la barre filetée et faites coulisser l'embase du poteau intermédiaire sur la barre et le connecteur pour poteau intermédiaire.

Le poteau intermédiaire devra être positionné exactement comme le poteau du bas, à 175mm (Fig. 3). Débarrassez le bas de l'embase de poteau de tout matériau en excès.

Lisse base suspendue

Vous êtes maintenant prêts à mesurer et poser la lisse base. Positionnez la lisse base contre l'embase de poteau du bas, comme illustré (Fig. 7) et à l'endroit où elle croise l'embase de poteau du haut, tracez le bord inférieur. À partir de ce repère, mesurez 78mm en retrait, tracez et coupez de longueur. Assemblez les deux parties du connecteur pour lisse base suspendue (MMBSCSQ), puis fixez-le à la lisse base à l'aide des vis fournies. Placez l'ensemble entre les pieds de platette, en faisant reposer la lisse base sur les nez de marches de l'escalier, et tracez la position des connecteurs pour lisse base sur la face des embases de poteau, à l'aide d'un crayon. Désassemblez le connecteur pour lisse base et fixez la partie correspondante sur les embases de poteau à l'aide des vis fournies. Enfin, une fois la lisse base en position, remontez les 2 parties du connecteur ensemble.

Connecteurs pour poteaux

Les connecteurs pour poteaux (MMNCSQ) peuvent maintenant être posés sur les embases à l'aide du goujon et de l'écrou à portée sphérique fournis. Tracez la

UK

Richard Burbidge Fusion™ stair balustrading comprises a patented system of round newel posts and handrails connected together using a series of metal brackets. Balusters fix into place using patented brackets designed to adjust to suit staircase pitches between 38° & 45°.

Note – When installing Richard Burbidge Fusion™, remember at all times that when you are assembling a pre-finished product extra care should be taken to avoid damaging the finish. All finishes are carefully checked prior to leaving the factory and are designed to withstand most types of normal use, however it is possible to damage these with sharp tools.

Please check all components carefully PRIOR to installation for any damage to the surface. Please note Richard Burbidge cannot be held responsible for any damage once installation has commenced.

Fusion™ carries design registration and has patent pending. Genuine Richard Burbidge Fusion™ components carry the Richard Burbidge dovetail logo. Only genuine components have been independently tested to guarantee conformity to UK building regulations.

Fusion™ is designed for use in domestic situations and will fit closed string staircases with pitches between 38° - 45° and handrail heights of 900mm stairs and 900mm landings. Fusion™ is tested to UK strength requirements of 0.36kN/m.

Tools required: Fusion™ Tool Kit (1)m diameter drill bit, crosshead No. 2 screwdriver, 13mm bookshort spanner 100mm long, 13mm spade bit, 20mm spade bit, 25mm spade bit, 5mm allen key, drill depth gauge), electric or battery drill, spirit levels, tape measure, a good handsaw, adjustable bevel, 45mm No. 8 crosshead countersunk screws for fixing the baserail.

Fusion™ is manufactured to exacting tolerances, however as timber is a natural material some expansion and or shrinkage of the timber components can occur. If the newels and rails are slightly too big for the connectors, gently sandshave the components to allow for a tight fit, being careful to only rework the area of the timber component that will be concealed by the metal connector. Alternatively if the timber component is loose in the connector, a rigid fix can be achieved using a proprietary gap filling adhesive.

Assembling Staircase Balustrading

Fusion™ will fit most staircase configurations. For further details please refer to the staircase configuration drawings in the brochure.

Fusion™ can be fitted to either existing or new newel bases. To use existing newel bases, these must be fixed centrally to the staircase string and the front face of the riser concerned (Figs 1 & 2).

Before removing existing newel bases, check that they are non-supporting or do not form a structural part of the staircase design.

When using Fusion™ your existing newel bases must be a minimum of 82mm x 82mm. If less, facebuild up existing bases using suitable facing material.

These instructions are for a straight flight with return landing.

Existing Bases

Fusion™ stairparts use pre-cut balusters, and all cut-off points are referenced from the top of the baserail upwards. The system is designed to automatically compensate for any slight inaccuracies in cutting off the existing newel post. Before newel bases can be set to the correct height the baserail must be installed. To do this, lay the baserail on the stair nosings and resting against the inside faces of the newel bases, mark and cut accordingly taking time to ensure a clean and accurate cut. Place the baserail on top of the staircase string, but at this stage, a temporary fix is all that is required ie tacks on unfinished or masking tape on finished rails (Fig. 3).

Bottom Newel Base

From the line representing the top edge of the baserail mark a line upwards through the center point of the newel base and where the two lines intersect measure up 175mm (Fig. 1).

Top Newel Base

The top newel base should be marked out in the same way as the bottom, but the height should be set at 125mm (Fig. 2).

It is important that existing newel bases are cut off squarely so that the newel posts are perfectly vertical. Once the bases are cut, trial fit the newel posts and check with a spirit level. The top of the bases can be sanded level if required. This will reduce the height of the bases slightly but the newel assemblies can compensate for this within the connectors. Once the bases have been levelled they can be chamfered to provide a more pleasing finish.

Newel Base Connectors

Newel base connectors (MMNCSG) can now be fixed to the newel bases using the stud and barrel nut supplied. From the top of the newel base on the centre line previously marked, measure down 125mm. Using a 20mm spade bit, drill a hole to a depth of 20mm beyond the centre point of the newel base (Fig. 4). On the top of the newel base find the centre by drawing two diagonal lines from corner to corner. Using a 13mm spade bit drill to a depth of 125mm. Note all drill operations should be straight and accurate. Assemble the newel base connector (MMNCSG) to newel base (Fig. 5) by locating the barrel nut and fully inserting the fixing stud. Place the newel base connector over the fixing stud and tighten nuts using 19mm socketbox spanner making sure that the connectors are positioned as illustrated (Fig. 6).

Note – in most cases when tightening the base connector to the existing bases, the retaining ring on the underside of the connector should pull into the newel base. However depending on the timber type it maybe necessary to disassemble the connector and chisel a clearance ring of approximately 3mm wide by 5mm deep allowing the newel base connector to sit flush.

Cut the bottom newel post to a length of 525mm and drill a 25mm diameter clearance hole at a depth of 25mm to the underside of the post to allow it to fit over the stud assembly. Fix post to the connector using screws provided making sure the post is fully inserted. Fix the top post in the same manner but do not cut the post to length at this stage.

Note – to mark the position of the clearance hole in the newel post, place newel into base connector, knock gently and then remove post.

New Newel Bases

Fit new newel bases central to the front faces of the staircase risers checking that they are vertical and at the correct height (Figs 1 & 2).

Note – remember to add the thickness of the baserail when marking the intersection points as illustrated in (Fig. 2.).

Fixing Connectors & Handrails

Fixing the handrails and connectors is best done by two people. To establish the correct angles of connectors and lengths of handrail, you will need to assemble two balusters. Fit the baluster brackets to the ends of the staircase balusters by inserting the screws supplied for a tight fit (Fig. 7). Note - ensure the baluster brackets are in line with each other by tightening the screws with the baluster held on two blocks of timber (Fig. 8). The balusters are pre-cut to length and should not require any modifications.

The bottom connector (MMBCSG) and top connector (MMTCSG) are a two-part assembly. Attach the newel post part of the connectors to the newel posts. Note – the top newel post connector slides over the top newel post and should not be permanently fixed at this stage. The handrail part of the bottom connector should now be attached to the overlong handrail. Offer the handrail assembly to the newel post connectors and to check that the handrail is parallel to the baserail and at the correct height, position assembled stair balusters to the underside of the handrail next to the bottom and top newel (Fig. 9).

Adjust the height of the top connector by sliding up and down the top post and check the balusters are vertical using a spirit level. Mark the position of the top connector to the newel post using a pencil and with the overlong handrail to the side of the top connector mark and cut the handrail to the required length (Fig. 10).

Fit the top post connector in place by setting to the previously marked pencil line and secure the newel post part of the connector using the screws supplied. It is important that this connector is fixed so that it is in line with the bottom newel. Fix the handrail connectors to the ends of the handrail and then fix this assembly to all newel post connectors checking that everything is vertical and parallel before securing all connector bolts, nuts and screws. You are now ready to fix the first and last balusters. The last baluster must be fixed so that it is tight against the handrail connector so as to conform to building regulations. Position the baluster between the handrail and baserail, check for vertical and mark the position of the baluster bracket to the baserail with a pencil. Remove the baluster and fix the baserail to the staircase string using 45mm No. 8 countersink screws.

The screw fixing the baserail to the staircase string should be positioned so that it does not interfere with the baluster bracket fixing screws. Reposition the baluster and fix to the handrail and baserail using the screws supplied. Fix the bottom baluster and space so that the gap between baluster and newel post is no greater than 99mm (Fig. 11).

To space the remaining balusters evenly up the stairs measure the distance between the spacing marks (notches on the side of the brackets) of the bottom and top balusters already installed (Fig. 11) and divide by 148.5mm. Round the answer up to the next whole number and divide this whole number back into your original measurement to give an exact spacing.

Example – **2159mm** between bottom and top spacing marks divided by **148.5mm = 14.45**, rounded up to **15**

2159mm ÷ 15 = 143.9mm spacing measurement.

Fix all remaining baluster brackets to balusters using the screws supplied (Fig. 7) ensuring the brackets are in line using the blocks of wood described previously (Fig. 8). Mark the spacing between balusters to the baserail either using a pencil and tape measure or by marking and cutting a piece of timber to the required length. Fix the assembled brackets and balusters to the baserail first making sure that on every 4th baluster you secret fix the baserail to the staircase string using 45mm No. 8 countersink screws. The top baluster brackets can now be fixed to the underside of the handrail using a spirit level to check for vertical.

Note – if you have a particularly short flight of stairs you may need to re-space the balusters to provide a more pleasing effect, remembering at all times to space them no more than 99mm apart.

Assembling Horizontal/Landing Balustrades

Using standard Fusion™ components you will require a minimum 120mm measured from the centre of the staircase baserail to the centre of the landing baserail for stairs with landings at 180° to the stairs (Fig. 12).

Cut and mitre the landing baserail to size and place into position on the landing. Do not fix to the landing floor at this stage (Fig. 12). Fix the landing balusters brackets to the landing balusters.

Place an off-cut of handrail loosely into the landing connector (MMLCSG). Position one assembled landing baluster onto the baserail and place the handrail and connector on top of this baluster and to the side of the top newel to establish the required height of the post. Mark and cut to suit.

Where the landing balustrade ends against the wall, mark the position of the wall connector (MMWCSG) on the wall by placing an assembled landing baluster and baluster connectors to off-cuts of baserail and handrail. Mark the position of the wall connector (MMWCSG) to the wall and drill and plug to suit.

Note – before drilling and plugging this fixed point check that the landing handrail will be parallel using a spirit level, if the landing floor is slightly out, reposition the wall connector (MMWCSG) and pack the underside of the landing baserail accordingly.

Place an off-cut of handrail to the landing connector (MMLCSG) and position on the top newel. Push the landing handrail into the wall connector (MMWCSG) and offer the horizontal turn (MMHTRSG or MMHTLSG) to where the two handrails meet to establish lengths of cut. Mark and cut the handrails to the required length. Reposition the landing handrail to the wall connector (MMWCSG) and fix horizontal turn (MMHTRSG or MMHTLSG) to the other end of this rail. Fix the short return length of handrail onto the other leg of the horizontal turn (MMHTRSG or MMHTLSG) and the landing connector (MMLCSG) to the other end of this short return length of handrail and position over the top newel post (Fig. 13).

Note – before screwing all connectors to rails and top post, we recommend a final check for parallel. Use a spirit level for the handrail and an assembled balusterbalusterbrackets between the rails.

To calculate the exact number of landing balusters either divide the total landing length by **117mm**, which will give a gap of approximately 98mm, or alternatively you may find it aesthetically more pleasing to space the landing balusters so that they are in line with the staircase balusters. Mark the position of the balusterbrackets to the baserail and secret fix the baserail to the landing floorboards using 45mm No. 8 countersink screws every 4th baluster.

Assemble all baluster brackets to the ends of the landing balusters by inserting the relevant fixing screw (63mm No. 8) into the underside of the brackets and tighten (Fig. 7). Ensure that the brackets are in line with each other as previously described for staircase balusters using two square blocks of timber (Fig. 8).

Fix all bottom baluster brackets to the baserail using 30mm No. 6 screws and finally secure the top baluster brackets to the underside of the landing handrail using 30mm No. 6 screws checking for vertical with a spirit level.

US

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Note - When installing Richard Burbidge Fusion™, remember at all times that when you are assembling a pre-finished product extra care should be taken to avoid damaging the finish. All finishes are carefully checked prior to leaving the factory and are designed to withstand most types of normal use, however it is possible to damage these with sharp tools.

Please check all components carefully PRIOR to installation for any damage to the surface. Please note Richard Burbidge cannot be held responsible for any damage once installation has commenced.

Fusion™ carries design registration and has patent pending. Genuine Richard Burbidge Fusion™ components carry the Richard Burbidge dovetail logo. Only genuine components have been independently tested to guarantee conformity to UK building regulations.

Fusion™ is designed for use in domestic situations and will fit closed string staircases with pitches between 38° - 45° and handrail heights of 35 ⅛" stairs and 39 ⅜" landings. Fusion™ is tested to UK strength requirements of 0.36kN/m.

Tools required: Fusion™ Tool Kit (1/8" diameter drill bit, crosshead No. 2 screwdriver, ½" bookshort spanner 4" long, 1/2" spade bit, ¾" spade bit, 1" spade bit, ⅛" allen key, drill depth gauge), electric or battery drill, spirit levels, tape measure, a good handsaw, adjustable bevel, 1 ¾" No. 8 crosshead countersunk screws for fixing the baserail.

Fusion™ is manufactured to exacting tolerances, however as timber is a natural material some expansion and or shrinkage of the timber components can occur. If the newels and rails are slightly too big for the connectors, gently sandshave the components to allow for a tight fit, being careful to only rework the area of the timber component that will be concealed by the metal connector. Alternatively if the timber component is loose in the connector, a rigid fix can be achieved using a proprietary gap filling adhesive.

Assembling Staircase Balustrading

Fusion™ will fit most staircase configurations. For further details please refer to the staircase configuration drawings in the brochure.

Fusion™ can be fitted to either existing or new newel bases. To use existing newel bases, these must be fixed centrally to the staircase string and the front face of the riser concerned (Figs 1 & 2).

Before removing existing newel bases, check that they are non-supporting or do not form a structural part of the staircase design.

When using Fusion™ your existing newel bases must be a minimum of 3 ¼" x 3 ¼". If less, facebuild up existing bases using suitable facing material.

These instructions are for a straight flight with return landing.

Existing Bases

Fusion™ stairparts use pre-cut balusters, and all cut-off points are referenced from the top of the baserail upwards. The system is designed to automatically compensate for any slight inaccuracies in cutting off the existing newel post. Before newel bases can be set to the correct height the baserail must be installed. To do this, lay the baserail on the stair nosings and resting against the inside faces of the newel bases, mark and cut accordingly taking time to ensure a clean and accurate cut. Place the baserail on top of the staircase string, but at this stage, a temporary fix is all that is required ie tacks on unfinished or masking tape on finished rails (Fig. 3).

Bottom Newel Base

From the line representing the top edge of the baserail mark a line upwards through the center point of the newel base and where the two lines intersect measure up 6 ⅞" (Fig. 1).

Top Newel Base

The top newel base should be marked out in the same way as the bottom, but the height should be set at 4 ⅞" (Fig. 2).

It is important that existing newel bases are cut off squarely so that the newel posts are perfectly vertical. Once the bases are cut, trial fit the newel posts and check with a spirit level. The top of the bases can be sanded level if required. This will reduce the height of the bases slightly but the newel assemblies can compensate for this within the connectors. Once the bases have been levelled they can be chamfered to provide a more pleasing finish.

Newel Base Connectors

Newel base connectors (MMNCSG) can now be fixed to the newel bases using the stud and barrel nut supplied. From the top of the newel base on the centre line previously marked, measure down 4 ⅞". Using a ¾" spade bit drill a hole to a depth of 1" beyond the centre point of the newel base (Fig. 4). On the top of the newel base find the centre by drawing two diagonal lines from corner to corner. Using a ½" spade bit drill to a depth of 4 ⅞". Note all drill operations should be straight and accurate. Assemble the newel base connector (MMNCSG) to newel base (Fig. 5) by locating the barrel nut and fully inserting the fixing stud. Place the newel base connector over the fixing stud and tighten nuts using ¾" socketbox spanner making sure that the connectors are positioned as illustrated (Fig. 6).

Note – in most cases when tightening the base connector to the existing bases, the retaining ring on the underside of the connector should pull into the newel base. However depending on the timber type it maybe necessary to disassemble the connector and chisel a clearance ring of approximately ⅛" wide by ¼" deep allowing the newel base connector to sit flush.

Cut the bottom newel post to a length of 20 ⅞" and drill a 1" diameter clearance hole at a depth of 1" to the underside of the post to allow it to fit over the stud assembly. Fix post to the connector using screws provided making sure the post is fully inserted. Fix the top post in the same manner but do not cut the post to length at this stage.

Note - to mark the position of the clearance hole in the newel post, place newel into base connector, knock gently and then remove post.

New Newel Bases

Fit new newel bases central to the front faces of the staircase risers checking that they are vertical and at the correct height (Figs 1 & 2).

Note - remember to add the thickness of the baserail when marking the intersection points as illustrated in (Fig. 3.).

Fixing Connectors & Handrails

Fixing the handrails and connectors is best done by two people. To establish the correct angles of connectors and lengths of handrail, you will need to assemble two balusters. Fit the baluster brackets to the ends of the staircase balusters by inserting the screws supplied for a tight fit (Fig. 7). Note - ensure the baluster brackets are in line with each other by tightening the screws with the baluster held on two blocks of timber (Fig. 8). The balusters are pre-cut to length and should not require any modifications.

The bottom connector (MMBCSG) and top connector (MMTCSG) are a two-part assembly. Attach the newel post part of the connectors to the newel posts. Note – the top newel post connector slides over the top newel post and should not be permanently fixed at this stage. The handrail part of the bottom connector should now be attached to the overlong handrail. Offer the handrail assembly to the newel post connectors and to check that the handrail is parallel to the baserail and at the correct height, position assembled stair balusters to the underside of the handrail next to the bottom and top newel (Fig. 9).

Adjust the height of the top connector by sliding up and down the top post and check the balusters are vertical using a spirit level. Mark the position of the top connector to the newel post using a pencil and with the overlong handrail to the side of the top connector mark and cut the handrail to the required length (Fig. 10).

Fit the top post connector in place by setting to the previously marked pencil line and secure the newel post part of the connector using the screws supplied. It is important that this connector is fixed so that it is in line with the bottom newel. Fix the handrail connectors to the ends of the handrail and then fix this assembly to all newel post connectors checking that everything is vertical and parallel before securing all connector bolts, nuts and screws. You are now ready to fix the first and last balusters. The last baluster must be fixed so that it is tight against the handrail connector so as to conform to building regulations. Position the baluster between the handrail and baserail, check for vertical and mark the position of the baluster bracket to the baserail with a pencil. Remove the baluster and fix the baserail to the staircase string using 1 ¾" No. 8 countersink screws.

The screw fixing the baserail to the staircase string should be positioned so that it does not interfere with the baluster bracket fixing screws. Reposition the baluster and fix to the handrail and baserail using the screws supplied. Fix the bottom baluster and space so that the gap between baluster and newel post is no greater than 3 ⅞" (Fig. 11).

To space the remaining balusters evenly up the stairs measure the distance between the spacing marks (notches on the side of the brackets) of the bottom and top balusters already installed (Fig. 11) and divide by 5 ⅞". Round the answer up to the next whole number and divide this whole number back into your original measurement to give an exact spacing.

Example - **85"** between bottom and top spacing marks divided by **5 ⅞" = 14.45**, rounded up to **15**.

85" ÷ 15 = 5 ⅔" spacing measurement.

Fix all remaining baluster brackets to balusters using the screws supplied (Fig. 7) ensuring the brackets are in line using the blocks of wood described previously (Fig. 8). Mark the spacing between balusters to the baserail either using a pencil and tape measure or by marking and cutting a piece of timber to the required length. Fix the assembled brackets and balusters to the baserail first making sure that on every 4th baluster you secret fix the baserail to the staircase string using 1 ¾" No. 8 countersink screws. The top baluster brackets can now be fixed to the underside of the handrail using a spirit level to check for vertical.

Note - if you have a particularly short flight of stairs you may need to re-space the balusters to provide a more pleasing effect, remembering at all times to space them no more than 3 ⅞" apart.

Assembling Horizontal/Landing Balustrades

Using standard Fusion™ components you will require a minimum 4 ¾" measured from the centre of the staircase baserail to the centre of the landing baserail for stairs with landings at 180° to the stairs (Fig. 12).

Cut and mitre the landing baserail to size and place into position on the landing. Do not fix to the landing floor at this stage (Fig. 12). Fix the landing baluster brackets to the landing balusters.

Place an off-cut of handrail loosely into the landing connector (MMLCSG). Position one assembled landing baluster onto the baserail and place the handrail and connector on top of this baluster and to the side of the top newel to establish the required height of the post. Mark and cut to suit.

Where the landing balustrade ends against the wall, mark the position of the wall connector (MMWCSG) on the wall by placing an assembled landing baluster and baluster connectors to off-cuts of baserail and handrail. Mark the position of the wall connector (MMWCSG) to the wall and drill and plug to suit.

Note - before drilling and plugging this fixed point check that the landing handrail will be parallel using a spirit level, if the landing floor is slightly out, reposition the wall connector (MMWCSG) and pack the underside of the landing baserail accordingly.

Place an off-cut of handrail to the landing connector (MMLCSG) and position on the top newel. Push the landing handrail into the wall connector (MMWCSG) and offer the horizontal turn (MMHTRSG or MMHTLSG) to where the two handrails meet to establish lengths of cut. Mark and cut the handrails to the required length. Reposition the landing handrail to the wall connector (MMWCSG) and fix horizontal turn (MMHTRSG or MMHTLSG) to the other end of this rail. Fix the short return length of handrail onto the other leg of the horizontal turn (MMHTRSG or MMHTLSG) and the landing connector (MMLCSG) to the other end of this short return length of handrail and position over the top newel post (Fig. 13).

Note - before screwing all connectors to rails and top post, we recommend a final check for parallel. Use a spirit level for the handrail and an assembled balusterbalusterbrackets between the rails.

To calculate the exact number of landing balusters either divide the total landing length by 4 ⅝", which will give a gap of approximately 3 ½", or alternatively you may find it aesthetically more pleasing to space the landing balusters so that they are in line with the staircase balusters. Mark the position of the baluster brackets to the baserail and secret fix the baserail to the landing floorboards using 1 ¼" No. 8 countersink screws every 4th baluster.

Assemble all baluster brackets to the ends of the landing balusters by inserting the relevant fixing screw (2 ½" No. 8) into the underside of the brackets and tighten (Fig. 7). Ensure that the brackets are in line with each other as previously described for staircase balusters using two square blocks of timber (Fig. 8).

Fix all bottom baluster brackets to the baserail using 1 ¼" No. 6 screws and finally secure the top baluster brackets to the underside of the landing handrail using 1 ¼" No. 6 screws checking for vertical with a spirit level.

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La balustrade Richard Burbidge est un système breveté. Elle permet de réaliser des ramparts d'escaliers ou de la balustrade horizontale. Elle se compose de poteaux et mains-courantes ronds qui s'assemblent les uns aux autres à l'aide d'une gamme complète de connecteurs métalliques. Les balustres se fixent avec des connecteurs brevetés qui sont conçus pour s'ajuster en fonction de la pente d'escalier. Cette dernière devant être comprise entre 38° et 45°.

Remarque – Pour installer le système Fusion™ de Richard Burbidge, souvenez-vous à chaque instant pour assembler un produit pré-verni, des précautions supplémentaires sont à prendre pour éviter d'endommager la finition. Toutes les finitions sont soigneusement contrôlées avant l'expédition des piéces et sont conçues pour supporter la plupart des types d'utilisation normale ; cependant, elles pourraient être endommagées par des outils tranchants.

Veuillez contrôler attentivement tous les composants AVANT la pose afin de vérifier qu'aucun élément n'est endommagé. Notez que Richard Burbidge ne pourra en aucun cas être tenu responsable des dommages causés lors de la pose.

La conception de Fusion™ est déposée et brevetée. Seuls les composants Fusion™ d'origine fabriqués par Richard Burbidge sont frappés du logo Richard Burbidge représentant un assemblage par queue d'aronde. Seuls ces composants d'origine ont été testés de manière indépendante pour garantir leur conformité à la réglementation britannique de la construction.

Fusion™ est conçu pour être utilisé dans des bâtiments d'habitation privés et s'adapte aux escaliers avec limons en bois ayant une pente comprise entre 38° et 45°. La hauteur de la main-courante est de 900 mm pour les ramparts d'escalier et de 1000 mm pour les balustrades horizontales. Fusion™ est testé selon les prescriptions britanniques de résistance à 0,36kN/m.

Outillage nécessaire : Trousse à outils Fusion™ (foret de diamètre 3mm, tournevis cruciforme No. 2, clé plate/douille 13mm longueur 100mm, foret à trois pointes de 13mm, foret à trois pointes de 20mm, foret à trois pointes de 25mm, clé Allen de 5mm, jauge de profondeur de perçage), perceuse électrique, niveau à bulle, mètre ruban, une bonne scie, fausse équerre, vis à tête fraisée de 45mm à empreinte cruciforme No. 8 pour la fixation de la lisse basse.

Fusion™ est fabriqué dans le respect absolu des écarts tolérés, mais comme le bois est une matière naturelle, les éléments en bois peuvent se dilater ou se rétracter. Si les poteaux et les rampes sont légèrement trop gros pour les joints, dégrossissez et poncez doucement ces éléments pour qu'ils s'encastrent parfaitement, en faisant attention à ne retravailler que la partie de l'élément en bois qui sera cachée par le joint en métal. Si au contraire, l'élément en bois n'est pas assez serré dans le joint, vous obtiendrez une fixation solide en mettant de la pâte à joint adhésive spécialement destinée à cet effet.

Montage de la balustrade pour un rampant d'escalier

Fusion™ s'adapte à la plupart des configurations de cage d'escalier. Pour de plus amples détails, veuillez consulter les plans de configuration d'escaliers dans la brochure.

Fusion™ peut être assemblé avec les embases de poteau Fusion™ ou en installant les embases de poteau existantes. Dans ce dernier cas, celles-ci doivent impérativement être centrée sur le limon et la face avant de la contremarche ou le nez de marche à l'escalier ne posséde pas de contremarche (Figs 1 & 2).

Avant de démonter les poteaux existants, contrôlez qu'ils ne sont pas porteurs ou qu'ils ne contribuent pas à la bonne tenue de la cage d'escalier.

Lorsque vous gardez et réutilisez des embases de poteau existantes, elles doivent mesurer au minimum 82mm x 82mm. Si elles mesurent moins, garnissez-les à l'aide d'un matériau d'apport adapté.

Ces instructions ci-après décrivent le cas d'un escalier à une volée droite avec un retour de palier.

Embases de poteaux existantes

Si vous utilisez de nouvelles embases de poteau Fusion™, passez directement à la rubrique intitulée "Nouvelles embases de poteau" puis référez-vous au paragraphe intitulé "Lisse basse supportée" un peu plus loin dans ce document déjà mis à langrave. Les dimensions permettant de localiser les coupes sont prises à partir du dessus de la lisse basse. Le système est conçu pour compenser automatiquement les légères imprécisions de découpe du poteau existant. Pour déterminer la hauteur des embases de poteau, posez la lisse basse sur les nez de marche de l'escalier et appuyez-la contre la face avant à l'intérieur de l'escalier des embases de poteau. Tracez le dessus de la lisse basse sur chaque embase. Sciez la lisse basse à longueur en prenant le temps nécessaire pour garantir une coupe propre et précise. Placez la lisse basse sur le dessus du limon. A ce stade, seule une fixation temporaire est nécessaire, c'est-à-dire un simple pointage (Fig. 3).

Embase de poteau bas

Sur la face de l'embase (située à l'intérieur de l'escalier), tracez la verticale passant par l'axe de l'embase. Elle coupe le trait correspondant à la face supérieure de la lisse basse. A partir de ce point d'intersection, remontez de 175mm, tracez la perpendiculaire à l'axe sur le pourtour de l'embase et sciez la (Fig. 1).

Il est impératif que la coupe soit d'équerre afin que le dessus de l'embase soit horizontal. Ainsi le poteau sera parfaitement vertical. Une fois l'embase sciée, faites un montage à blanc du poteau et vérifiez la verticalité de ce dernier avec un niveau à bulle. Au besoin, poncez le dessus de l'embase. La hauteur sera alors légèrement diminuée mais le connecteur pour poteau (fixation du poteau sur son embase) vous permettra de compenser cette différence.

Une fois le poteau assemblé, vous pouvez chanfreiner les arêtes de l'embase pour des raisons esthétiques.

Embase de poteau haut

Procéder de la même manière que pour le poteau bas en ramenant les 175mm à 125mm (Fig. 2).

Connecteurs pour poteaux

Les connecteurs pour poteau (MMNCSG) peuvent maintenant être posés sur le dessus du poteau et de l'écrou à barillet fourni. Tracer la verticale passant par l'axe de l'embase puis mesurer 125mm à partir du haut de celle-ci. A l'aide du foret à trois pointes de 20mm, percez un trou à une profondeur de 20mm au-delà de l'axe de l'embase (Fig. 4). Sur le dessus de l'embase, tracez les diagonales. A leur intersection, percez un trou de 125mm de profond avec du foret à trois pointes de 13mm. Notez que toutes les opérations de perçage devront être droites et précises. Assemblez le connecteur pour poteau (MMNCSG) sur l'embase (fig. 5) en positionnant l'écrou à barillet et en insérant entièrement le goujon de fixation. Placez le connecteur pour poteau sur le goujon de fixation, et serrez les écrous à l'aide de la clé polygonale/douille de 19mm, en veillant à ce que le connecteur soit positionné comme illustré (Fig. 6).

Remarque – dans la plupart des cas, lors du serrage du connecteur de poteau sur des embases existantes, la bague de retenue en sous-face du connecteur devrait pénétrer dans l'embase. Cependant, en fonction du type de bois, il pourra être nécessaire de démonter le connecteur et de claider une couronne de dégagement d'environ 3mm de largeur par 5mm de profondeur, pour permettre au connecteur pour poteau de reposer correctement sur la face supérieure de l'embase.

Coupez le poteau bas à une longueur de 525mm. Sur l'extrémité basse du poteau, percez un trou de dégagement de 25mm de diamètre et de 25mm de profond pour lui permettre de se loger au-dessus de l'assemblage du goujon. Fixez le montant au connecteur à l'aide des vis fournies, en veillant à ce que le poteau soit inséré à fond dans le connecteur. Fixez le poteau haut de la même manière, mais ne le coupez pas de longueur pour l'instant.

Remarque – pour repérer la position du trou de dégagement dans le poteau, placez celui-ci dans le connecteur de poteau, tapez doucement sur celui-ci puis retirez-le.

Nouvelles embases de poteau

Posez les nouvelles embases en les centrant sur le limon et la face avant de la contremarche ou le nez de marche si l'escalier ne possède pas de contremarche (Figs 1 & 2). Veillez à vérifier la verticalité et ces dernières avant de les fixer.

Remarque – pensez à ajouter l'épaisseur de la lisse basse lors du tracage des points d'intersection, comme illustré sur la (Fig. 3).

Fixation des mains-courantes et de leurs connecteurs

Il vaut mieux être à deux pour fixer les mains-courantes et les connecteurs. Pour déterminer les bons angles des connecteurs et les longueurs de main-courante, vous devez assembler deux balustres pour rampant d'escalier. Posez les connecteurs de balustre aux extrémités des balustres, fixez l'ensemble avec les vis fournies (Fig. 7). *Remarque* - Lors du vissage des connecteurs, vérifiez que ces derniers restent alignés les uns par rapport aux autres, comme décrit précédemment pour les balustres (Fig. 8). Les balustres ont été coupés mis à longueur en usine et ne devraient pas, dans la majeure partie des cas, nécessiter de modifications.

Le connecteur bas (MMBCSG) et le connecteur haut (MMTCSG) se composent de 2 parties. Mettez en place la partie se fixant sur les poteaux. *Remarque* – le connecteur haut coulisse sur le poteau haut et ne doit pas être fixé de manière définitive pour l'instant. Mesurez et sciez la main-courante en prévoyant une sur-cote. Engagez cette main-courante dans l'autre partie du connecteur bas. Présentez l'ensemble. La main-courante doit être parallèle à la marche et à la hauteur définitive (900mm mini à partir du nez de marche), positionnez les balustres pour rampant d'escalier préalablement assemblés à chaque extrémité du rampart (Fig. 9).

Ajustez le hauteur du connecteur haut en le faisant glisser précautionneusement le long du poteau pour ne pas détériorer la couche de vernis. Vérifiez que les balustres sont verticaux en utilisant un niveau à bulle. Tracez la position du connecteur haut sur le poteau à l'aide d'un crayon. Tracez et ajustez la main-courante en longueur (Fig. 10).

Mettez en place le connecteur haut en le faisant glisser précautionneusement le long du poteau, et bloquez la partie se fixant sur le poteau à l'aide des vis fournies. Il est important de fixer ce connecteur de façon à ce qu'il soit aligné avec celui du poteau bas. Fixez l'autre partie à l'extrémité de la main-courante. Fixez l'ensemble aux poteaux en veillant que tout est vertical et parallèle avant de bloquer l'ensemble des connecteurs. Vous pouvez maintenant fixer les premier et dernier balustre. Pour se conformer à la réglementation, le dernier balustre doit être fixé de manière à ce que le connecteur vienne en butée contre le connecteur haut de main-courante. Positionnez le balustre entre la main-courante et la lisse basse en vérifiant qu'il est vertical, et tracez la position du connecteur de balustre sur la lisse basse à l'aide d'un crayon. Enlevez le balustre et fixez la lisse basse au limon à l'aide de la vis à tête fraisée No. 8 de 45mm.

La vis de fixation de la lisse basse au limon doit être positionnée de telle sorte qu'elle ne constitue pas un obstacle pour les vis de fixation des connecteurs de balustre. Replacez le balustre et fixez le sur la main-courante et la lisse basse à l'aide des vis fournies. Fixez le balustre du bas et écartez-le de façon à ce que le jeu entre le poteau et le balustre ne dépasse pas 99mm (1101mm pour la France) (Fig. 11).

Pour espacer régulièrement les balustres restants le long de l'escalier, mesurez la distance entre les repères d'espacement (encoches sur le côté des contre-marches de balustres) des balustres haut et bas déjà installés (Fig.11) et divisez par 148.5mm. Arrondissez le résultat au nombre entier suivant et re-divisez votre mesure d'origine par ce nombre entier pour obtenir l'espacement exact.

Exemple – **2159mm** entre les repères d'espacement haut et bas, divisé par **148.5mm = 14.45**, arrondi à **15**.

2159mm ÷ 15 = 143.9mm d'écartement à mesurer.

Fixez l'ensemble des connecteurs de balustres restants aux balustres à l'aide des vis fournies (Fig. 7) en veillant au bon alignement des connecteurs de balustres, comme précédemment décrit (Fig. 8). Tracez l'écartement entre les balustres sur la lisse basse, soit à l'aide d'un crayon et d'un mètre-ruban, soit en traçant et en coupant un montage de bois à la longueur voulue. Fixez d'abord les connecteurs de balustres sur la lisse basse en pensant d'abord à fixer (de façon invisible) la lisse basse au limon à l'aide de vis à tête fraisée No. 8 de 45mm, tous les 4 balustres. Les connecteurs de balustre haut peuvent maintenant être fixés sous la main-courante à l'aide d'un niveau à bulle pour vérifier la verticalité des balustres.

Remarque – si vous avez une volée d'escalier particulièrement courte, vous devrez peut-être espacer à nouveau les balustres pour obtenir un aspect plus agréable, en pensant toujours à ne pas les écarter de plus de 99mm (1101mm pour la France) les uns des autres.

Assemblage des balustrades pour paliers horizontaux

A l'aide des composants Fusion™ standard, vous aurez besoin d'une cote minimum de 120mm entre l'axe de la lisse basse du rampart d'escalier et l'axe de la lisse basse du palier lorsque l'escalier est parallèle au palier (Fig. 12).

Coupez à l'onglet la lisse basse de palier à la cote et mettez-la en position sur le palier. Ne la fixez pas au plancher du palier pour l'instant (Fig. 12). Posez les connecteurs de balustres pour palier sur les balustres.

Placez une chute de main-courante sans la fixer dans le connecteur pour palier (MMLCSG). Positionnez un balustre pour palier horizontal préalablement assemblé sur la lisse basse et placez la main-courante et le connecteur sur le dessus de ce balustre et sur le poteau du haut pour déterminer la hauteur requise de ce dernier. Tracez et coupez à la longueur voulue.

Lorsque la balustrade de palier se termine contre un mur, tracez la position du connecteur mural (MMWCSG) sur le mur en plaçant un balustre pour palier horizontal préalablement assemblé avec des connecteurs de balustre sur des chutes de lisse basse et de main-courante. Tracez la position du connecteur mural (MMWCS) sur le mur, puis percez et chevillez.

Remarque – avant de percer et de cheviller ce point fixe, contrôlez que la main-courante de palier sera parallèle au sol, à l'aide d'un niveau à bulle. Si le plancher de palier est légèrement en pente, repositionnez le connecteur mural (MMWCSG) et ajustez la longueur de la lisse basse pour qu'elle repose sur le sol tout en étant parfaitement horizontale.

Placez une chute de main-courante sur le connecteur pour palier (MMLCSG) et positionnez-la sur le poteau du haut. Enfoncez la main-courante du palier dans le connecteur mural (MMWCSG) et présentez le retour horizontal (MMHTRSG ou MMHTLSG) à l'endroit où les deux mains-courantes se rencontrent, pour déterminer les longueurs à couper. Tracez et découpez les mains-courantes à la longueur voulue. Repositionnez la main-courante de palier sur le connecteur mural (MMWCSG) et fixez le retour horizontal (MMHTRSG ou MMHTLSG) à l'autre extrémité de cette main-courante. Emmanchez et fixez la main-courante constituant le retour (plus petit montage) dans le retour horizontal (MMHTRSG ou MMHTLSG). Mettez en place le connecteur pour palier (MMLCSG) à l'autre extrémité de cette main-courante, puis positionnez-le sur le poteau du haut (Fig. 13).

Remarque – avant de visser l'ensemble des connecteurs aux lisses et au poteau du haut, nous vous conseillons de procéder à un contrôle final de parallélisme. Utilisez un niveau à bulle pour la main-courante et faire glisser un balustre entre la lisse basse et la main courante sur toute la longueur de balustrade.

Pour calculer le nombre exact de balustres pour le palier, divisez la longueur totale de palier par **117mm**, ce qui donnera un jeu d'environ 98mm, ou bien vous pouvez trouver plus esthétique d'espacer les balustres de façon à ce qu'ils s'alignent avec les balustres d'escalier, sans toutefois les espacer de plus de 110mm. Tracez la position des connecteurs de balustre sur la lisse basse et fixez discrètement la lisse basse sur les lames de plancher du palier à l'aide de vis à tête fraisée No. 8 de 45mm tous les 4 balustres.

Montez l'ensemble des connecteurs de balustre à l'extrémité des balustres pour palier en insérant la vis de fixation fournie (